

standard should require proof of the precision and accuracy of measurements and instruments, using the definitions and principles specified in the C95.3-1992 document (2).

**Categorical exclusions:**

- FDA opposes the standard's "low-power exclusion clause," because "recent data from technical publications and other sources indicate that certain lower powered RF devices, such as hand-held, portable, two-way radios, cellular phones, and other personal communication devices can induce relatively high SARs in portions of the body of nearby persons" (1).

**Transitional procedures:**

- Not addressed.

**State Preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**FORD MOTOR COMPANY**  
**Comments on RF Environmental Guidelines Amendments**  
**(January 25, 1994)**

**Interest:** Ford automobiles will be equipped with "optional radiating devices," including mobile cellular transceivers.

**Adoption of ANSI/IEEE Standard:**

- The public interest will be served by the FCC's ultimate adoption of the exposure limits of the 1992 ANSI/IEEE guidelines. However, before what was designed as a voluntary guideline may fairly be used as a government regulation, additional clarity as to compliance measurements is needed (2-3).

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- Because many parts of an auto interior are within 20 cm of some object, the Commission must clarify how fields can be measured reliably in such areas (5-7).
- If SAR data were required, other measurement difficulties, recognized by the standard, would have to be overcome before compliance could be mandated (7-12).

**Categorical exclusions:**

- Not addressed.

**Transitional procedures:**

- Not addressed.

**State Preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**DAVID SMITH FORSMAN**  
Comments on RF Environmental Guidelines Amendments  
(July 28, October 21 and December 9, 1993)

**Interest:** Idaho amateur radio operator and broadcast technician comments by three letters.

**Adoption of 1992 ANSI/IEEE Standard:**

- In a letter addressing a range of matters, Mr. Forsman asserts "it is likely that ANSI C95.1-1992 poses an excessive set of regulations for intermittent-duty services such as amateurs, two-way, and citizen band." (Dec. 9, at 1.)

**Induced currents:**

- Not addressed.

**Contact currents:**

- Mr. Forsman computes that "Realistic Model TRC-217" "walkie-talkie" would produce contact currents exceeding those allowed in an "uncontrolled environment." Argues this rule would produce needless product disappearances. (Oct. 21, at 1.)

**Controlled v. Uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- Not addressed.

**Categorical exclusions:**

- Amateur radio operator requests categorical exclusion for transmitter power levels up to 300 watts PEP, because he fears compliance with new standard would require antenna heights that would violate local restrictions. (July 28, at 1.)

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**PROFESSOR OM P. GANDHI**  
**Comments on RF Environmental Guidelines Amendments**  
**(October 13 and 22, 1993)**

**Interest:** Professor and Chairman, University of Utah Department of Electrical Engineering, "writing as a researcher" submits three research papers the FCC "may find of interest" in connection with the rulemaking. He also is Co-Chair, Subcommittee IV of IEEE Standards Coordinating Committee 28.

**Adoption of 1992 ANSI/IEEE Standard:**

- Not addressed.

**Induced currents:**

- The October 22 letter encloses a paper by Tofani ("Induced Foot-Currents in Humans Exposed to Radio-Frequency EM Fields") that gives the measurements and numerical calculations of current induced in the human body close to FM transmitting antennas in the frequency band 90-104 MHz. This paper shows that substantial currents would indeed be induced in a human for the MPE electric fields suggested in the ANSI/IEEE C95.1-1992 Safety Standard. Dr. Gandhi states he is aware of the opposition by some parties to the need for foot current measurements for frequencies above 50 MHz. The data presented in this paper is to the contrary. Since currents in excess of the RF safety guidelines could result for both controlled and uncontrolled environments, it appears to Dr. Gandhi to be important to measure not only the E- and H-fields, but also the induced currents up to the maximum frequency of 100 MHz recommended in the ANSI/IEEE C95.1-1992 Safety Standard. As shown in this paper, induced currents are also substantial up to at least 100 MHz. It may, therefore, be desirable to limit induced and contact RF currents for the entire FM band up to 108 MHz (1).

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- Not addressed.

**Categorical exclusions:**

- Dr. Gandhi's October 22 letter reports recently evaluating rates of electromagnetic energy absorption (specific absorption rates or SARs) in the human head for ten typical cellular telephones capable of operating at a peak power of 0.6 watts or 600 milliwatts in the frequency band 820-850 MHz. The peak 1 g of SAR is on the order of 0.09 to 0.29 W/kg, depending on the telephone and the nature of its antenna. This is considerably smaller than 1.6 W/kg given for the uncontrolled environments in the ANSI/IEEE C95.1-1992 RF standard (1-2). Appended is the paper entitled "Electromagnetic Absorption in the Human Head for Cellular Telephones."
- See other issues.

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other issues:**

- Appended to Dr. Gandhi's October 13 letter, but not discussed by Dr. Gandhi in either letter is his paper entitled, "Electromagnetic Absorption in the Human Head for a Proposed 6 GHz Handset."

**GLENAYRE ELECTRONICS, INC.**  
**Comments on RF Environmental Guidelines Amendments**  
**(November 12, 1993)**

**Interest:** A manufacturer of infrastructure equipment for the paging industry  
(1).

**Adoption of 1992 ANSI/IEEE Standard:**

- Not addressed.

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Most of the paging facilities are indeed "controlled environments" by the nature of the installations; that is in areas designated for use by the paging transmitting equipment. These areas have controlled access for trained technical personnel and have provisions to restrict access by non-technical personnel (1-2).
- Work in the vicinity of any antenna should be restricted. Knowledgeable technical personnel should be available where maintenance in the vicinity of an antenna is to be performed. The function of this person will be to evaluate the necessity of reducing transmitter power as required to prevent the power density from exceeding the guidelines during the maintenance period. In extreme cases, transmitting equipment should be disabled as is presently done where broadcast equipment is involved (3).

**Measurement and compliance procedures:**

- Not addressed.



**Categorical exclusions:**

- Glenayre recommends that the FCC continue the use of a categorical exclusion for the paging industry and for transmitters up to and including RF power levels of 500 watts or 3500 watts ERP (which ever is greater) (2).
- Due to the power levels in use "one does not have to move but a short distance" before power density is below the 1992 guideline. Using a "worst case" example, the distance required is "conservatively 3 to 4 meters in the main beam of the antenna" (2).
- Worker exposure should not be a basis for removing categorical exclusion. Proper safety awareness of the guidelines is a prerequisite for working around high powered RF equipment. What can be said of the RF equipment used by the paging industry is that it is not a sufficiently high power so as to cause the exclusion to be removed. Exposure threats can be handled in the industry by training and personnel awareness of specific actions required during test and maintenance functions. As a manufacturer with concern for the health and safety of our customers, Glenayre Electronics provides warning labels where necessary to alert users of possible dangers where that danger might exist (4).

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**GTE SERVICE CORPORATION**  
**Comments on RF Environmental Guidelines Amendments**  
**(January 25, 1994)**

**Interest:** Provides a number of wireless communications services, including cellular services, 800 MHz air-to-ground services, and satellite services.

**Adoption of 1992 ANSI/IEEE Standard:**

- Supports adoption of the standard as fostering public understanding regarding the substantial margin of safety as well as providing assurances for consumers of wireless technologies (i-iv).
- The ANSI/IEEE standard, upon which the FCC has relied since 1985, continues to be the most relevant and reliable guideline in this area (2-3).
- The standards are based on voluminous research, reflect long consideration by numerous experts, and employ conservative margins of error with significant safety factors (4-6).

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Notes that the controlled environment standard provides a tenfold margin of safety for occupational exposure and a fiftyfold margin for the public, not even taking account of other built-in conservative assumptions (5-6).
- All the wireless service facilities used by GTE are well below the limits for either type of environment (11-17).

**Measurement and compliance procedures:**

- Not addressed.

**Categorical exclusions:**

- Part 22 mobile devices, including cellular portables, transportables, vehicular portables, and 800 MHz air-to-ground primary aircraft transmission sources, as well as Part 15 mobiles, including cordless telephones and cordless GTE Airfone handsets, should remain categorically exempted due to low power levels and, in the case of airplane mounted transmitters, design and mounting practices that reduce exposure (7-9).
- Part 22 mobile stations operate for short periods of time, which provides further assurances of safety in light of the standard's time-averaging principles (9-10).
- Part 22 base station transmitting facilities and Part 21 microwave point-to-point facilities should continue to be categorically excluded, because such facilities are low power, inaccessible and used intermittently and, consequently, exposures are well within the 1992 guidelines (11-17).

**Transitional procedures:**

- Since existing Part 15 and Part 22 facilities comply with the new guidelines by a wide margin, no basis exists to impose recertification costs on the industry or the FCC (10-11).

**State preemption:**

- Not addressed.

**Other issues:**

- GTE expressly endorses CTIA's Cellular Industry Scientific Advisory Group and adopts CTIA low-power arguments (iii, 8).

**PROF. MARK J. HAGMANN**  
Comments on RF Environmental Guidelines Amendments  
(January 10, 1994)

**Interest:** Department of Electrical and Computer Engineering, Florida International University, listed as a member of IEEE Standard Coordinating Committee 28 Subcommittee IV in C95.1-1992.

**Adoption of 1992 ANSI/IEEE Standard:**

- Professor Hagmann, speaking as one who has "studied various aspects of the biological effects of electromagnetic fields as my research specialty for the past 18 years," published widely, "served on IEEE SCC28, ANSI C95.4," "been an expert witness in both county and federal courts," and testified in Senate hearings, argues that the FCC's "proposed ruling should not be put into effect" (1).
- His specific focus of substantive criticism is limited to the treatment of induced RF currents (see below).
- He also criticizes the absence of written procedures governing SCC 28 activities, says that, although listed as a member, he was not consulted, and concludes, "I do not know how a standards document can be taken seriously if the operating procedures of the committee are not properly defined" (5-6).

**Induced currents:**

- Professor Hagmann objects to the "treatment of induced RF currents" because: (a) "there is a bias favoring one type of instrument," (b) "limiting current measurements to the point of entry on the human body" is "not appropriate," (c) "the upper frequency limit (100 MHz) is not appropriate," and (d) "there is a relevant conflict of leadership of IEEE Standards Coordinating Committee 28." Specifically, he criticizes Professor Gandhi's alleged influence on the standard and Professor Gandhi's alleged failure to disclose that he holds patents applicable to recommended measurement equipment which might yield personal profit for Professor Gandhi and the University of Utah (2-4).

**Contact currents:**

- See induced current.

**Controlled v. Uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- Not addressed.

**Categorical exclusions:**

- Not addressed.

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**HAMMETT & EDISON, INC.**  
**Comments on RF Environmental Guidelines Amendments**  
**(January 2, 1994)**

**Interest:** Consulting engineering firm providing consultation to clients on communications, radio, television, and related engineering matters. Member of Subcommittee 4 of IEEE Standards Coordinating Committee 28.

**Adoption of ANSI/IEEE Standard:**

- Does not oppose FCC adoption of ANSI 1992 although it believes that certain portions of the standard are flawed and not justified by scientific evidence. (3)
- Believes that the FCC should impose a temporary moratorium on the effectiveness of the induced and contact current standards for frequencies above 30 MHz until commercially available instruments exist that will permit reliable measurements at frequencies above 30 MHz. (3)

**Induced currents:**

- The proposed cut-off frequency of 100 MHz for induced currents is arbitrary on its face. Requiring all FM broadcast facilities to measure induced currents when co-located with a facility operating below 100 MHz will, in reality, impose measurement burdens on all non-exempt facilities. (11,12)
- The ANSI standard is defective by not defining the impedance of a "standard person" at VHF frequencies. (12)
- The FCC must standardize measurements procedures for body currents. These should be measured with one foot raised to simulate a walking person. Also, ankle straps should be used in conjunction with an "RF boot" to ensure consistent and conservative readings. Measurements should be made at uniform heights. (14)

**Contact currents:**

- No meters exist to measure contact currents at frequencies above 30 MHz. (13)

**Controlled v. uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- Supports adopting ANSI C95.3 as an FCC guideline for measurement practices. Applauds the minimum separation distance of 20 centimeters for near-field survey instruments. (16)

**Categorical exclusions:**

- Not addressed.

**Transitional procedures:**

- The FCC should impose a temporary moratorium on the effectiveness of the induced and contact current standards for frequencies above 30 MHz until commercially available instruments exist that will permit reliable measurements at frequencies above 30 MHz. (3)

**State preemption:**

- The FCC should pre-empt non-federal agencies from adopting any statutes, guidelines or policies more stringent than those adopted in this proceeding. Existing local guidelines that are more stringent than the those adopted here should be superseded unless the local government submits a showing to the FCC demonstrating its technical expertise in RF matters, the need locally for more stringent standards and that the local agency has the infrastructure necessary to administer the and enforce the regulations. (7) In support, commenters describe several examples where local governments imposed significant burdens upon FCC licensees constructing radio facilities where the calculated exposure levels were well below the ANSI standard. (3-7)

**Other issues:**

- The FCC should modify its rules to clarify what non-categorically exempt facilities need to be considered in RFR engineering studies and how far removed from the proposed facility should the applicant be required to examine. (9)
- If the FCC endorses the use of RF protective clothing, the immense difficulties created by ANSI for on-tower induced and contact currents will be ameliorated. (15)

## **HATFIELD & DAWSON CONSULTING ENGINEERS, INC.**

### **Comments on RF Environmental Guidelines Amendments**

**(November 11, 1993)**

**Interest:** Professional engineering corporation with "considerable experience in the prediction and measurement of electromagnetic fields" (1).

#### **Adoption of ANSI/IEEE Standard:**

- While the new ANSI/IEEE C95.1-1992 standard represents a significant advance over C95.1-1982 in the understanding of electromagnetic effects, it cannot be applied wholecloth to the needs of FCC licensees (6).
- The C95.1-1992 electric and magnetic field maximum permissible exposure limits are not consistent in their application to medium frequency (MF) and VHF broadcast services. The "Uncontrolled Environment" electric field MPE is fixed at 614 Volts per meter (V/m) for frequencies up to 1340 kHz in the AM band and ramps downward as a function of frequency above this point while the ramp for "Controlled Environment" electric fields begins at 3.0 MHz. The implication is that AM stations operating at frequencies above 1340 kHz are somehow creating a greater human exposure hazard for "Uncontrolled Environments" than for "Controlled Environments" (6).

#### **Induced currents:**

- Experience has shown that it is mainly at high power HF sites that induced currents exceed the 100mA per foot MPE shown in C95.1-1992. The standard is based upon research that was performed using far field plane wave exposure situations on barefooted subjects. Neither of these assumptions are realistic in "Controlled Environments" (5).

#### **Contact currents:**

- In reality the only measurable contact currents caused by AM fields result from touching large objects that are reasonably efficient antennas. Cranes, power poles and other metallic structures on the order of one hundred feet in height are the major sources of measurable contact currents. Numerous measurements have shown that fences, flag poles and other conducting objects more than a quarter wavelength away from AM antennas or arrays do not present a contact current hazard (4).
- HF facilities present a more complicated contact current environment. Guy wires associated with HF antennas with transmitter output powers in the 5 kW to 10 kW



range often are sources of contact current above the 100 mA Maximum Permissible Exposure (MPE). As a result contact currents should be routinely measured at all HF facilities (4).

- Contact currents can be a real problem at VHF TV and FM sites. Any metallic fence, pole, guy wire, etc. will probably exhibit measurable contact currents (4).
- If the Commission adopts the C95.1 standard for contact currents as it stands, measurements would not be required for those FM stations above 100 MHz. This would be an absurd requirement. On the other hand, to extend the contact current MPE to the upper end of the FM band, or to exempt the entire FM band from the contact current requirement would mean making scientific judgments that the Commission has in the past refused to make because of lack of expertise (5).

#### **Controlled v. Uncontrolled environment:**

- Questions the consistency and clarity of the controlled, uncontrolled definitions, which H&D discusses in terms of "informed consent" (1-2).

#### **Measurement and compliance procedures:**

- Disputes the accuracy of FCC compliance bulletin OST 65 regarding fields from AM, FM and TV transmission sites. H&D prefers Gelley and Tell methodology in a 1985 EPA report (2-3).
- The C95.1-1992 standard uses SAR, which is proportional to power density. Available meters, which measure the electric or magnetic field contribution to power density, do not give accurate power density data in "many near field measurement situations" and, thus, H&D recommend an instrument "described in a paper" by Gassman (1993) (3).
- Determination of the hazard potential of objects affected by AM fields, and whether contact currents should be measured, can usually be determined by electric and magnetic field measurements (4).
- Field measurements of induced currents at AM, FM and TV transmission facilities could resolve the apparent contradiction between the data based upon laboratory experiments and the practical experience of broadcast engineers (5).
- The thrust of the induced current MPE appears misguided. The electric and magnetic field exposure MPE is based upon the specific absorption rate. The specific absorption rate (SAR) is a measure of the heating caused by currents flowing in the body. Measuring the induced foot currents in addition to electric and magnetic field measurements is therefore redundant in that the effects of local

SARs in the feet are, or should be, a part of the existing field exposure standard (6).

**Categorical exclusions:**

- Not addressed.

**Transitional procedures:**

- Not addressed.

**State Preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**KEN HOLLADAY**  
**Comments on RF Environmental Guidelines Amendments**  
**(February 2, 1993)**

**Interest:** Gilroy, California resident submitted a "petition for rulemaking" that was treated by the FCC as a comment in this docket and referenced in NPRM note 21.

**Adoption of 1992 ANSI/IEEE Standard:**

- Not addressed.

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- Not addressed.

**Categorical exclusions:**

- Not addressed.

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other Issues:**

- The single-page petition proposes to "prohibit the sale of all hand-held phones and radios that operate between 400 MHz and 1300 MHz" until "the health issues are resolved."
- The petition attached a January 31, 1993 story from the San Jose Mercury News entitled, "Cellular phone industry rocked by cancer scare."

**IEEE STANDARDS COORDINATING COMMITTEE 28,  
NON-IONIZING RADIATION**  
Comments on RF Environmental Guidelines Amendments  
(November 4, 1993)

**Interest:** Responds through a Subcommittee 4 "working group on interpretations" to FCC questions about adopting the standard presented in the rulemaking notice.

**Adoption of 1992 ANSI/IEEE Standard:**

- "Since the guideline (IEEE C95.1-1991) proposed for adoption by the FCC was developed by SC-4 of SCC 28 on a voluntary basis, and such guideline is used on a voluntary basis as well, it is inappropriate for the SCC 28 to endorse the choice of its own guideline by the FCC" (1).
- Many of the several issues raised by the Commission in its NPRM are matters that can only be addressed in terms of possible revisions of the existing guidelines, a process that requires approval by consensus of both the developing Subcommittee and the members of SCC 28, and final approval by the IEEE Standards Board (1).
- The Working Group on Interpretations established by the members of SC-4 will be actively responding to requests for interpretation of ANSI/IEEE C95.1-1992 in the months and years ahead. This is an important new role for SC-4 members, attributable in large part to the complexity of the new C95.1 guideline relative to its predecessors. Copies of written interpretations will be forwarded by the Working Group to SCC 28 for consideration as a supplement to the standard or for inclusion in the next revision. If the FCC adopts the ANSI/IEEE C95.1-1992 guideline for evaluating the environmental effects of radiofrequency radiation, the IEEE-SCC 28 suggests that all subsequent interpretations or supplements to that guideline inhere to such adoption (3).

**Induced currents:**

- The issue relating to the discontinuity of treatment within the FM band (Paragraph 22 and Footnote 24 of the NPRM) has already been addressed during the process of reaching consensus. It was made clear to ANSI at that time that the discontinuity of treatment within the FM band was based upon biological considerations rather than those involved in spectrum allocation (1-2).

**Contact currents:**

- See induced currents.

**Controlled v. Uncontrolled environment:**

- The intent of the definitions of "controlled" and "uncontrolled" environments should be clear to all. The standard-making process, explicitly rejected occupational vs general population as categories on the grounds . . ." that no reliable scientific data exist indicating that certain subgroups of the population are more at risk than others." Instead, adhering to the scientific base of data, SC-4 established two classes of exposure environments, controlled and uncontrolled. The rationale states clearly, "The important distinction is not the population type, but the nature of the exposure environment." The terms "controlled environment" and "uncontrolled environment" are defined explicitly in Section 2, Definitions and Glossary of Terms of ANSI/IEEE C95.1-1992. Any interpretation of the guideline that equates controlled environments with occupational exposure and uncontrolled environments with general population exposure is a distortion of the standard and should be avoided (2).
- Further, any tendency by the Commission to equate "awareness of the potential for exposure as a concomitant of employment, by other cognizant persons . . ." with expertise obtained by formal training should also be recognized as a revision of the ANSI/IEEE "environmental" tiers into hazard-based "population" tiers that were explicitly rejected by SC-4 (e.g., Paragraph 12 and Footnote 16 of the NPRM) (2).

**Measurement and compliance procedures:**

- Not addressed.

**Categorical exclusions:**

- The interpretation of the ANSI/IEEE exclusions for low-power devices offered by the Commission (NPRM Paragraph 16 and Footnote 16) that they "will consider that hand-held portable devices . . . must comply with the requirements specified for uncontrolled environments" is contrary to the reason for existence of the low-power exclusion. Further, such an interpretation involves invoking a population-based two tier concept that is contrary to the ANSI/IEEE controlled, uncontrolled environments concept. The exclusion is based upon a variety of measurements that show the fundamental SAR limits to be satisfied with the possible exception, as noted in the guideline, when the radiating structure is maintained within 2.5 cm of the body. For such devices, the exposure of other persons in the immediate vicinity of the user will meet the exclusion criterion for the uncontrolled environment. In other words, when an excluded device meets the requirement of

the controlled environment for the user/controller, who can be expected to be aware that the device emits an RF signal, the device also ipso facto satisfies the uncontrolled specification for the neighboring/adjacent non-user (3).

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other issues:**

- Not addressed.

**IEEE STANDARDS COORDINATING COMMITTEE 28, SUBCOMMITTEE 4**  
**Comments on RF Environmental Guidelines Amendments**  
**(October 11, 1993)**

**Interest:** Responds to June 2, 1993 FCC letter on appropriateness of extending standard's Section 4.2 formulas up to 2200 MHz.

**Adoption of 1992 ANSI/IEEE Standard:**

- Whether Section 4.2 formulas used for "frequencies between 450 and 1500 MHz" can be used "up to a frequency of 2200 MHz" for "determining exclusions based on radiated power" is beyond Sub. Comm. 4's "interpretation" jurisdiction since it would require an "exemption/revision of the existing standard". The response predicted that such an extension by the FCC would be "conservative with respect to future standard extensions" (1-2).
- The "conservative" prediction reflects that the formulas in Section 4.2 of IEEE C95.1-1991 suggest a continued dropping of power with increased frequency. There is considerable belief, however, that a "deminimus" power,  $P_{min}$ , exists which, when absorbed in a small volume of normal tissue, will not lead to thermal damage or violate the specific SAR rules properly interpreted for partial-body exposure. SC-4 believes that  $P_{min}$  is high enough to deter future extension of the subject formulas to 10 GHz and above. Therefore, between 1.5 and 10 GHz, at worst, the formulas might be extended part way but then would shift into a modified trend upward from straight extrapolation.

**Induced currents:**

- Not addressed.

**Contact currents:**

- Not addressed.

**Controlled v. Uncontrolled environment:**

- Not addressed.

**Measurement and compliance procedures:**

- Not addressed.



**Categorical exclusions:**

- Not addressed.

**Transitional procedures:**

- Not addressed.

**State preemption:**

- Not addressed.

**Other issues:**

- Not addressed.